

**CLAIMS**

1. A consumable electrode type arc welding machine which makes use of an arc generated between a base metal of welding and a wire supplied thereto, the machine comprising:
  - a welding voltage detection circuit for detecting a welding voltage and outputting a welding voltage detection signal;
  - a welding current detection circuit for detecting a welding current and outputting a welding current detection signal;
- 10 a short-circuit arc judgment circuit for outputting a short-circuit arc judgment signal, after accepting the welding voltage detection signal and judging whether the machine is in a short-circuit state or in a arc state;
- 15 a short-circuit waveform control circuit for outputting a short-circuit waveform control signal after accepting the welding current detection signal;
- an arc waveform control circuit for outputting an arc waveform control signal for an arc period after accepting the welding voltage detection signal; and
- 20 a switching circuit which accepts the short-circuit waveform control signal and the arc waveform control signal and selects the arc waveform control signal in the arc period or the short-circuit waveform control signal in the short-circuit period based on the short-circuit arc judgment signal, and outputs a selected signal;
- 25 wherein a welding power is controlled by the output from the switching circuit,  
characterized in that,

the machine further comprises an arc resistance calculator for calculating and outputting an arc resistance signal after accepting the welding voltage detection signal and the welding current detection signal, and the arc resistance signal is delivered to at least one 5 of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power.

2. The consumable electrode type arc welding machine according to claim 1, wherein

10 the short-circuit waveform control circuit accepts the welding current detection signal and the arc resistance signal and outputs a short-circuit waveform control signal based on the arc resistance signal,

15 the switching circuit selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,

20 the welding power is controlled based on the output from the switching circuit.

3. The consumable electrode type arc welding machine according to claim 1, wherein

25 the arc waveform control circuit accepts the welding voltage detection signal and the arc resistance signal and outputs an arc waveform control signal based on the arc resistance signal,

the switching circuit selects the arc waveform control signal

when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,

5       the welding power is controlled based on the output from the switching circuit.

4. The consumable electrode type arc welding machine according to claim 1, wherein

10      the short-circuit waveform control circuit accepts the welding current detection signal and the arc resistance signal and outputs a short-circuit waveform control signal based on the arc resistance signal,

15      the arc waveform control circuit accepts the welding voltage detection signal and the arc resistance signal and outputs an arc waveform control signal for the arc period based on the arc resistance signal,

20      the switching circuit selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,

the welding power is controlled based on the output from the switching circuit.

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5. A consumable electrode type arc welding machine which makes use of an arc generated between a base metal of welding and a wire

supplied thereto, the machine comprising:

a welding voltage detection circuit for detecting a welding voltage and outputting a welding voltage detection signal;

5 a welding current detection circuit for detecting a welding current and outputting a welding current detection signal;

a short-circuit arc judgment circuit for outputting a short-circuit arc judgment signal after accepting the welding voltage detection signal and judging whether the machine is in a short-circuit state or in a arc state;

10 a short-circuit waveform control circuit for outputting a short-circuit waveform control signal after accepting the welding current detection signal;

an arc waveform control circuit for outputting an arc waveform control signal for an arc period after accepting the welding voltage  
15 detection signal; and

a first switching circuit which accepts the short-circuit waveform control signal and the arc waveform control signal and selects the arc waveform control signal in the arc period or the short-circuit waveform control signal in the short-circuit period based on the  
20 short-circuit arc judgment signal, and outputs a selected signal;

wherein a welding power is controlled by the output from the first switching circuit,

characterized in that,

the machine further comprises:

25 an arc resistance calculator for calculating and outputting an arc resistance signal after accepting the welding voltage detection signal and the welding current detection signal;

a constant-current control period setting unit outputting a constant-current control period signal which indicates a constant-current control period after accepting the arc resistance signal and when the arc resistance signal continues exhibiting a value  
5 that is greater than a certain specific value;

a constant-current circuit for outputting a constant-current signal for implementing a certain specific constant-current value after accepting the welding current detection signal and based on the inputted welding current detection signal; and

10 a second switching circuit for selecting, in accordance with the constant-current control period signal, one of the constant-current signal in the constant-current control period and the output signal from the first switching circuit in a period other than the constant-current control period, and outputting a selected  
15 signal;

wherein in the period other than the constant-current control period, the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit, and the welding power is controlled based on the output from  
20 the second switching circuit.

6. The consumable electrode type arc welding machine according to claim 5, wherein

the short-circuit waveform control circuit accepts the welding  
25 current detection signal and the arc resistance signal and outputs a short-circuit waveform control signal based on the arc resistance signal,

the first switching circuit selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,

the welding power is controlled based on the output from the second switching circuit.

7. The consumable electrode type arc welding machine according  
10 to claim 5, wherein

the arc waveform control circuit accepts the welding voltage detection signal and the arc resistance signal and outputs an arc waveform control signal based on the arc resistance signal,

the first switching circuit selects the arc waveform control  
15 signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,

the welding power is controlled based on the output from the  
20 second switching circuit.

8. The consumable electrode type arc welding machine according  
to claim 5, wherein

the short-circuit waveform control circuit accepts the welding  
25 current detection signal and the arc resistance signal and outputs  
a short-circuit waveform control signal based on the arc resistance  
signal,

the arc waveform control circuit accepts the welding voltage detection signal and the arc resistance signal and outputs an arc waveform control signal for the arc period based on the arc resistance signal.

- 5        the first switching circuit selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period, the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal,
- 10      the welding power is controlled based on the output from the second switching circuit.